

State Permit No. LTS 5004-90-12
 DEN Number: 359141-05
 Effective Date: July 13, 2012
 Amended Date: October 16, 2012
 Amended Date: March 14, 2013
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B. GENERAL DESCRIPTION OF OPERATION/DISCHARGES

The Inland Bays Regional Wastewater Treatment Facility (RWTF) collects and treats domestic wastewater from the Long Neck Sanitary Sewer District (LNSSD), the Oak Orchard Sanitary Sewer District (OOSSD), and the Angola Sanitary Sewer District (ANSSD).

The Inland Bays RWTF is a secondary treatment facility designed to treat a summer maximum monthly average daily flow of 2.0 MGD and consists of an activated sludge system with two phased-aeration basins for biological nutrient removal (BNR), two clarifiers, one chlorine contact chambers for disinfection, a 39 million gallon effluent storage lagoon, a 32 million gallon storage lagoon and solids handling, storage and dewatering facilities.

Sussex County disposes of biosolids via land application onto the Hettie Lingo field and the Tower Field at the Inland Bays RWTF, among other property under the same permit under State Permit AGU 1504-S-03 (effective July 1, 2015 to June 30, 2020). Prior to disposal, the sludge will be processed to achieve Class B Biosolids requirements per DNREC and federal regulations, and dewatered into cake.

The system’s design disposal capacity is 2.65 MGD. The treated wastewater is spray irrigated onto 432.5 acres via eight center pivot spray irrigation systems. The wetted fields will be planted in corn (grain) and soybean (grain) during the summer growing season and in winter wheat during the winter.

Design Treatment Capacity: 2.0 MGD

Design Flows:

Season	Flow Rate (MGD)
Summer Maximum Month ADF	2.0 MGD
Summer Average Month ADF	1.8 MGD
Winter Maximum Month ADF	1.5 MGD
Winter Average Month ADF	1.4 MGD
Annual Average ADF	1.5 MGD
Peak Day Flow	3.7 MGD

Design Disposal Capacity:

Wetted Field Area	Acres	Rate (in/wk)	Effluent Disposal Capacity (MGD)	Sussex County Tax Map No.
North Field	103.0	1.86	0.73	2-34-22-12
South Field	103.0	1.86	0.73	2-34-22-16
North Burton Field	52.0	1.5	0.3	2-34-22-12
South Burton Field	41.9	1.0	0.18	2-34-22-12
North Hettie-Lingo Field	47.5	1.0	0.18	2-34-22-19
South Hettie-Lingo Field	30.48	2.0	0.24	2-34-22-19
East Hettie-Lingo Field	34.46	1.0	0.13	2-34-22-19
West Hettie-Lingo Field	20.16	2.0	0.16	2-34-22-19
Total	432.5		2.65	

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C. INFLUENT LIMITATIONS

1. The average monthly quantity of influent to the wastewater treatment facility shall not exceed 2.0 Million Gallons per Day.

Design Treatment Capacity: 2.0 MGD

D. SPRAYED EFFLUENT LIMITATIONS

During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to discharge to the spray irrigation field(s) identified on page 1 of this permit the quantity and quality of effluent specified below:

1. The average monthly quantity of effluent discharged from the wastewater treatment facility to the spray fields shall not exceed 2.65 Million Gallons per Day in any calendar month.

Design Disposal Capacity: 2.65 MGD

2. The average weekly quantity of effluent discharged to the spray irrigation fields shall not exceed the following limits.

Wetted Field Area	Rate (in/wk/acre)
North Field	1.86
South Field	1.86
North Burton Field	1.5
South Burton Field	1.0
North Hettie-Lingo Field	1.0
South Hettie-Lingo Field	2.0
East Hettie-Lingo Field	1.0
West Hettie-Lingo Field	2.0

3. The quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 0.25 inches/acre/hour.
4. There shall be a minimum rest period of three (3) hours between applications on each spray field. There must be a sufficient rest period between applications to prevent field saturation from occurring in any part of the field. If direct runoff occurs as a result of wastewater irrigation, application rates must be reduced.
5. There shall be a minimum one (1) hour rest period when the center pivot reaches any in-field end stops if the instantaneous application rate exceeds a rate of 0.125 inches/acre in any one hour.
6. The pH of the effluent shall not be less than 5.5 standard units nor greater than 9.0 standard units.
7. The total residual chlorine concentration shall not be less than 1.0 mg/L nor more than 4.0 mg/L.
8. The Chloride concentration of the effluent shall not exceed 250 mg/L on an average annual basis.

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9. The Sodium concentration of the effluent shall not exceed 210 mg/L on an average annual basis.
10. The total amount of nitrogen that may be applied to each spray field acre shall not exceed 250 lbs/year. This amount includes supplemental fertilizers, the nitrogen supplied from the effluent, and any other source. The limitation of total nitrogen that can be applied to each acre may be adjusted by the Ground Water Discharges Section if it can be shown through subsequent analysis of the crop removed that the total nitrogen removed with the crop is equal to the amount applied from the effluent and additional fertilizer applications. Supplemental additions of commercial fertilizers shall be limited to amounts necessary to meet crop needs in accordance with the written recommendations of the University of Delaware Cooperative Extension Service for the specified crop and anticipated yield.
11. The discharge to the spray irrigation fields shall be free from material such as floating solids, sludge deposits, debris, scum, oil and grease in quantities that would be deleterious to the proper operation and maintenance of the spray fields.
12. Because the facility has been designed for Restricted Public Access, the effluent must meet the following limits:

Parameter	Daily Permissible Average Concentration at Design Flows
BOD ₅	50.0 mg/L
Total Suspended Solids	90.0 mg/L
Fecal Coliform	200 colonies/100 mL

E. BUFFER REQUIREMENTS

1. A buffer zone of at least 150 feet shall be maintained between the edge of the wetted field area and all highways, individual lots and property lines.
2. A buffer zone of 50 feet shall be maintained between the wetted edge of the spray field and the edge of any wetlands or any perennial lake or stream provided that the buffer zone is maintained in perennial vegetation.
3. A buffer zone of 100 feet shall be maintained between the wetted edge of the spray field and all other areas not previously mentioned in items 1 and 2 of Buffer Requirements.

F. GROUND WATER REQUIREMENTS

Operation of the wastewater treatment facility and spray irrigation system shall not cause the quality of Delaware's ground water resources to be in violation of applicable Federal or State Drinking Water Standards on an average annual basis.

G. MONITORING REQUIREMENTS

Permittee shall initiate periodic reporting required under Part I.1.2 upon initiation of irrigation activities for all of the following monitoring requirements.

During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to discharge to spray irrigation fields identified on page 1 of this permit. Such discharge shall be monitored by the permittee as specified as follows:

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1. INFLUENT MONITORING REQUIREMENTS

Parameter	Sample Location	Unit Measurement	Monitoring Frequency	Sample Type
BOD ₅	Influent	mg/L	Monthly	Composite
Influent Flow	Plant Inlet	Gal/day	Continuous	Recorded/Totalized
pH	Influent	S.U.	Monthly	In-situ
TSS	Influent	mg/L	Monthly	Composite

2. SPRAYED EFFLUENT MONITORING REQUIREMENTS

Samples taken in compliance with the monitoring requirements for all parameters specified above shall be taken from the irrigation pump station wet well with the exception of Total Residual Chlorine, PH, and Fecal Coliform which shall be taken at the wet well located at the effluent end of the chlorine contact chamber.

Parameter	Unit Measurement	Monitoring Frequency	Sample Type
Ammonia Nitrogen	mg/L	Monthly	Composite
BOD ₅	mg/L	Twice per month	Composite
Cadmium	mg/L	Annually	Composite
Chloride	mg/L	Quarterly	Composite
Copper	mg/L	Annually	Composite
Effluent Flow	Gal/day	Continuous	Recorded/Totalized
Fecal Coliform	Col/100 ml	Twice per month	Grab
Lead	mg/L	Annually	Composite
Nickel	mg/L	Annually	Composite
Nitrate + Nitrite Nitrogen	mg/L	Monthly	Composite
Organic Nitrogen	mg/L	Monthly	Calculation
pH	S.U.	Daily	In-situ
Potassium	mg/L	Quarterly	Composite
Sodium	mg/L	Quarterly	Composite
Total Nitrogen	mg/L	Monthly	Composite
Total Phosphorus	mg/L	Monthly	Composite
Total Residual Chlorine	mg/L	Daily	Grab
Total Suspended Solids	mg/L	Twice per month	Composite
Zinc	mg/L	Annually	Composite

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3. GROUND WATER MONITORING REQUIREMENTS

Groundwater samples shall be taken from each monitoring well for the facility as listed below. Groundwater monitoring well locations are depicted on the Site Maps found on Pages 3 and 4 of this Permit.

Samples taken in compliance with the monitoring requirements specified shall be taken at each monitoring well in accordance with procedures approved by the Department and listed in the State of Delaware, Field Manual for Groundwater Sampling (Custer, 1988).

Groundwater monitoring results for each monitoring well shall be reported using the State of Delaware Well Identification Tag Number that is required on all wells in accordance with the Delaware Regulations Governing the Construction and Use of Wells, Section 10, A.

All field sampling logs and laboratory results for samples obtained from a well shall be identified by the DNREC ID affixed to the well.

Groundwater samples shall be tested from the following wells for the following parameters:

a. GROUNDWATER QUALITY MONITORING

Local ID	DNREC ID	Local ID	DNREC ID
MW - 1	86145	MW - 13	208215
MW - 2	86146	MW - 14	208216
MW - 3	237996	MW - 15	208217
MW - 4	237997	MW - 16	228543
MW - 5	86153	MW - 18	237074
MW - 6	86150	MW - 21	238298
MW - 7	86151	MW - 22	238299
MW - 8	86152	MW - 23	238967
MW - 9	86148	MW - 24	238968
MW - 10	89573	MW - 25	238969
MW - 11	208213	MW - 26	238970
MW - 12	208214		

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Parameter	Unit Measurement	Measurement Frequency	Sample Type
Ammonia as Nitrogen	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Depth to Water	hundredths of a foot	Monthly	In-Situ
Dissolved Oxygen	mg/L	Quarterly	Field Test
Fecal Coliform	Col/100mL	Quarterly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Quarterly	Grab
pH	S.U.	Quarterly	Field Test
Sodium	mg/L	Quarterly	Grab
Specific Conductance	µS/cm	Quarterly	Field Test
Temperature	°C	Quarterly	Field Test
Total Dissolved Solids	mg/L	Quarterly	Grab
Total Nitrogen	mg/L	Quarterly	Grab
Total Phosphorus	mg/L	Quarterly	Grab

b. GROUNDWATER TABLE ELEVATION MONITORING REQUIREMENTS

Ground water level measurements shall be taken from the following observation wells for the following parameters:

Local ID	DNREC ID	
OW 19	237999	South Burton Field
OW 17	228544	North Burton Field North Hettie-Lingo
OW 20	237998	Field
OW 27	242932	West Hettie-Lingo Field South Hettie-Lingo
OW 28	242933	Field

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Depth to Water	hundredths of a foot	Monthly	In-Situ

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- c. While performing the monitoring as required by Part I.G.3.a or I.G.3.b of this permit, if the 'Depth to Water' in any one of the following monitoring wells lies within 3 feet of the ground surface, the permittee shall be required to collect additional weekly depth to water measurements from that monitoring well. The permittee may discontinue the additional weekly sampling for depth to water when the water table in each well is deeper than 3 feet below ground surface. The additional monitoring is necessary to ensure that spray irrigation ceases on any area of the spray fields where the ground water lies within 2 feet of the ground surface in accordance with Part III.A.3 of this permit. The additional water table measurements must be recorded in the operator's log, and must be reported to the Ground Water Discharges Section in accordance with Part I.I.2 of this permit.

Spray Irrigation Field	Local ID	DNREC ID
South Field:	MW7	86151
	MW10	89573
	MW23	238967
	MW24	238968
North Field:	MW3	237996
	MW5	86153
North Burton Field:	MW2	86146
	MW16	228543
	OW17	228544
South Burton Field:	MW13	208215
	OW19	237999
North Hettie Lingo Field:	MW14	208126
	OW20	237998
East Hettie Lingo Field:	OW27	242932
West Hettie Lingo Field:	MW7	86151
	OW27	242932
South Hettie Lingo Field:	MW15	208217
	OW28	242933

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4. LYSIMETER MONITORING REQUIREMENTS

Lysimeter monitoring sampling shall be taken from the following lysimeters for the following parameters. The constituents are listed below in highest priority first. In the event that enough sample is not obtained to test for all parameters listed, the sample shall be tested for as many constituents possible in the following order:

Local ID	DNREC ID	Field
Lys-1	237807	South Burton
Lys-2	237808	North Hettie-Lingo
Lys-3	241292	North Burton
Lys-4	241934	East Hettie-Lingo

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Total Nitrogen	mg/L	Quarterly	Grab
Total Phosphorus	mg/L	Quarterly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Quarterly	Grab
Ammonia as Nitrogen	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Sodium	mg/L	Quarterly	Grab
Total Dissolved Solids	mg/L	Quarterly	Grab
pH	S.U.	Quarterly	Field Test
Specific Conductance	μS/cm	Quarterly	Field Test
Temperature	°C	Quarterly	Field Test